

What is claimed is:

1 1. A method of forming an injection molded plastic part in a
2 mold, comprising:
3 sealing the mold to prevent gas leakage from the mold cavity;
4 applying an initial gas pressure in the mold cavity;
5 injecting plastic material into the mold cavity;
6 increasing the gas pressure in the mold cavity up to a preselected
7 value;
8 injecting gas into the plastic material after 90%-99% of the
9 preselected amount of plastic material has entered the mold cavity;
10 venting the gas from the mold cavity at a controlled rate;
11 allowing the plastic material to harden forming a hollow molded
12 article;
13 venting the gas from the hollow molded article; and
14 removing the completed plastic article from the mold.

1 2. The method of forming an injection molded plastic part
2 as recited in claim 1 wherein the initial gas pressure is supplied from a first gas
3 source and said injection of gas is supplied from a second gas source.

1 3. The method of forming an injection molded plastic part
2 as recited in claim 2 wherein the first and second gas sources are the same.

1 4. The method of forming an injection molded plastic part
2 as recited in claim 1 wherein the step of removing the completed plastic part
3 from the mold comprises opening the mold and ejecting the part.

1 5. The method of forming an injection molded plastic part
2 as recited in claim 4 wherein the part is ejected from the mold by at least one
3 ejector pin assembly.

1 6. The method of forming an injection molded plastic part
2 as recited in claim 1 wherein the gas is injected into the plastic material by at
3 least one gas pin assembly.

1 7. The method of forming an injection molded plastic part
2 as recited in claim 1 wherein the gas pressure in the mold cavity is maintained
3 at a pre-selected value by a gas control mechanism.

1 8. The method of forming an injection molded plastic part
2 as recited in claim 7 wherein said gas control mechanism is infinitely
3 adjustable.

1 9. The method of forming an injection molded plastic part
2 as recited in claim 1 further comprising the step of venting the injected gas from
3 the plastic material before the part is removed from the mold.

1 10. The method of forming an injection molded plastic part
2 as recited in claim 9 wherein the injected gas is vented through a gas pin
3 assembly.

1 11. The method of forming an injection molded plastic part
2 as recited in claim 7 wherein said gas control mechanism comprises a vent
3 valve.

1 12. A system for forming an injection molded plastic part in a
2 mold comprising:
3 a mold, said mold having a part-forming mold cavity therein;
4 sealing members for sealing said mold cavity and preventing gas
5 leakage therefrom;
6 a first gas source for supplying a gas into the mold cavity to pre-
7 pressurize the mold cavity to a first pre-determined value;
8 a vent valve for removing said gas from the mold cavity as
9 desired;

10 a gas control mechanism for maintaining the gas pressure in the
11 mold cavity at a second pre-determined value;
12 a source for injecting molten plastic material into the mold
13 cavity;
14 a gas pin assembly for supplying gas into the plastic material in
15 the mold cavity; and
16 a second gas source for supplying gas to said gas pin assembly.

1 13. The system as recited in claim 12 further comprising:
2 at least one ejector pin assembly for ejecting the completed
3 plastic part from the mold cavity.

1 14. The system as recited in claim 12 wherein said first and
2 second gas source are the same source.

1 15. The system as recited in claim 12 wherein said gas
2 control mechanism comprises an infinitely adjustable gas control valve.